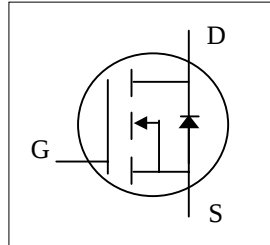


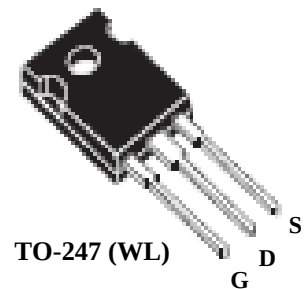
- ▼ 100% R_g & UIS Test
- ▼ Ultra-Fast Body Diode
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	650V
$R_{DS(ON)}$	74m Ω
I_D	37.5A

Description

XP65SA074F series are innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications. The TO-247 package is widely preferred for commercial-industrial applications. The device is suited for switch mode power supplies, DC-AC converters and high current high speed switching circuits.



Absolute Maximum Ratings@ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 20	V
V_{GS}	Gate-Source Voltage, AC ($f > 1\text{Hz}$)	± 30	V
$I_D@T_C=25^{\circ}\text{C}$	Drain Current, V_{GS} @ 10V	37.5	A
$I_D@T_C=100^{\circ}\text{C}$	Drain Current, V_{GS} @ 10V	23.7	A
I_{DM}	Pulsed Drain Current ¹	110	A
dv/dt	MOSFET dv/dt Ruggedness ($V_{DS} = 0 \dots 480\text{V}$)	40	V/ns
$P_D@T_C=25^{\circ}\text{C}$	Total Power Dissipation	277.7	W
$P_D@T_A=25^{\circ}\text{C}$	Total Power Dissipation	3.12	W
E_{AS}	Single Pulse Avalanche Energy ³	512	mJ
dv/dt	Peak Diode Recovery dv/dt ⁴	15	V/ns
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
R_{thj-c}	Maximum Thermal Resistance, Junction-case	0.45	$^{\circ}\text{C}/\text{W}$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient	40	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	650	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =18A	-	-	74	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	5	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =18A	-	28	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =520V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±1	uA
Q _g	Total Gate Charge	I _D =18A	-	127	203	nC
Q _{gs}	Gate-Source Charge	V _{DS} =520V	-	33	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	59	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =325V	-	28	-	ns
t _r	Rise Time	I _D =18A	-	46	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	86	-	ns
t _f	Fall Time	V _{GS} =10V	-	35	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	4900	7840	pF
C _{oss}	Output Capacitance	V _{DS} =100V	-	140	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	16	-	pF
R _g	Gate Resistance	f=1.0MHz	-	2	4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =18A, V _{GS} =0V	-	0.8	-	V
t _{rr}	Reverse Recovery Time	I _S =18A, V _{GS} =0V	-	160	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	1.4	-	uC

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Pulse test
- 3.Starting T_j=25°C , V_{DD}=90V , L=100mH , R_G=25Ω , V_{GS}=10V
- 4.I_{SD} ≤ I_D, V_{DD} ≤ BV_{DSS}, starting T_j = 25°C

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

YAGEO XSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

YAGEO XSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

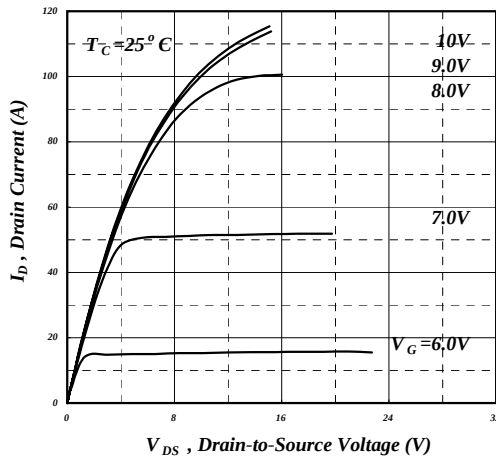


Fig 1. Typical Output Characteristics

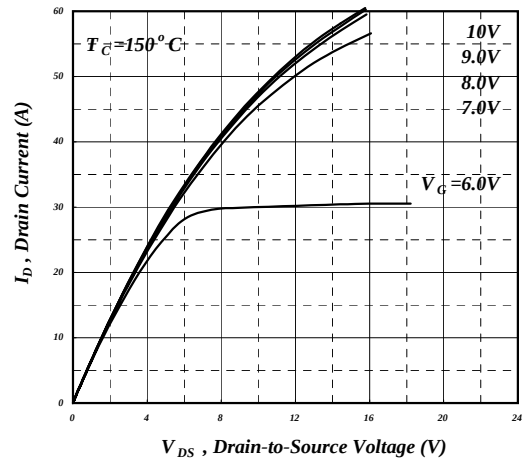


Fig 2. Typical Output Characteristics

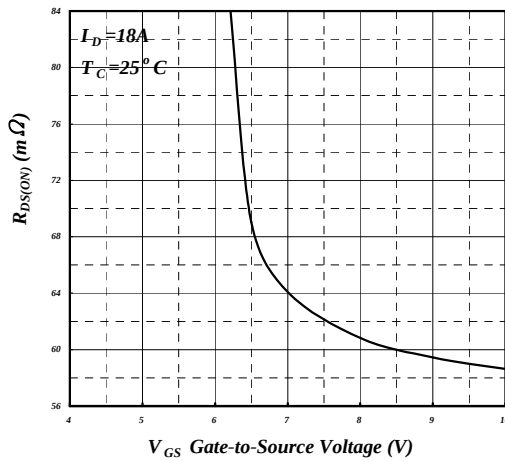
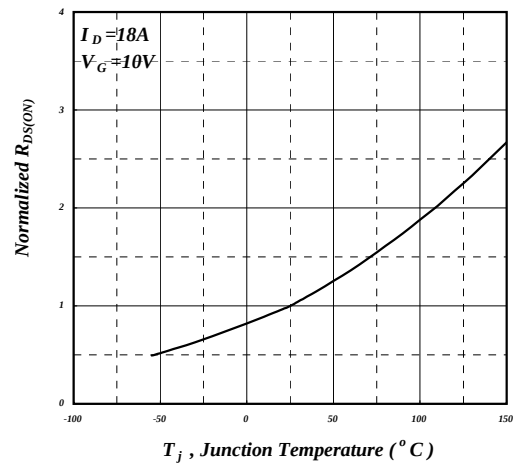
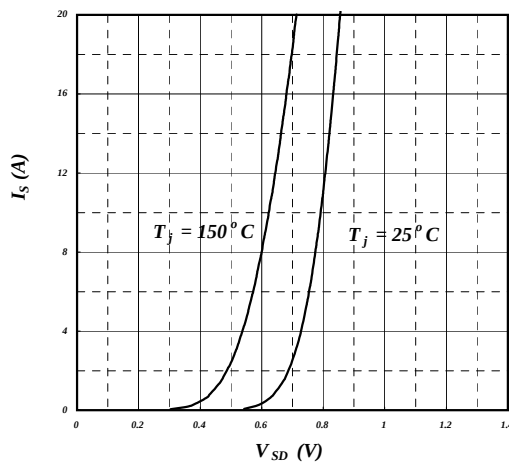


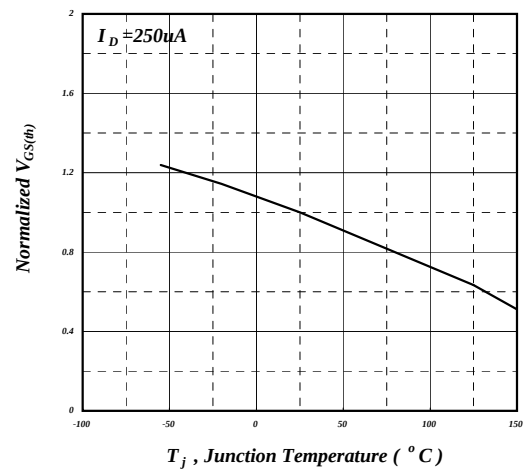
Fig 3. On-Resistance v.s. Gate Voltage



**Fig 4. Normalized On-Resistance
v.s. Junction Temperature**



**Fig 5. Forward Characteristic of
Reverse Diode**



**Fig 6. Gate Threshold Voltage v.s.
Junction Temperature**

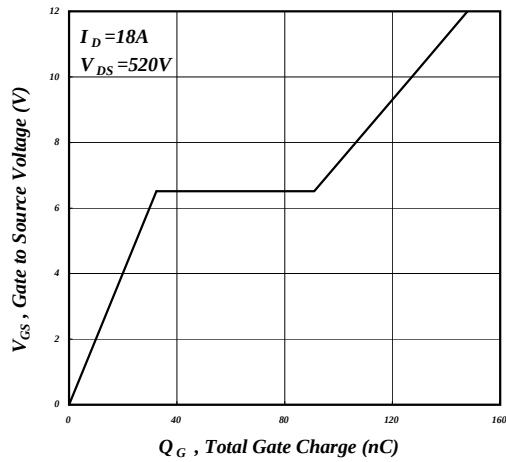


Fig 7. Gate Charge Characteristics

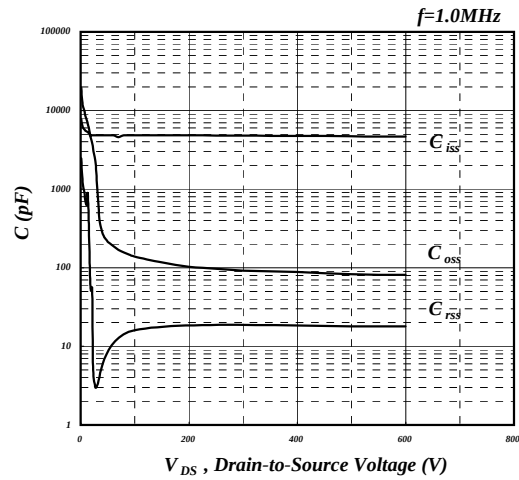


Fig 8. Typical Capacitance Characteristics

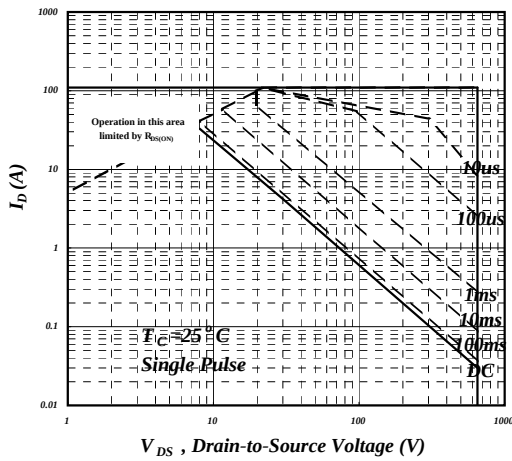


Fig 9. Maximum Safe Operating Area

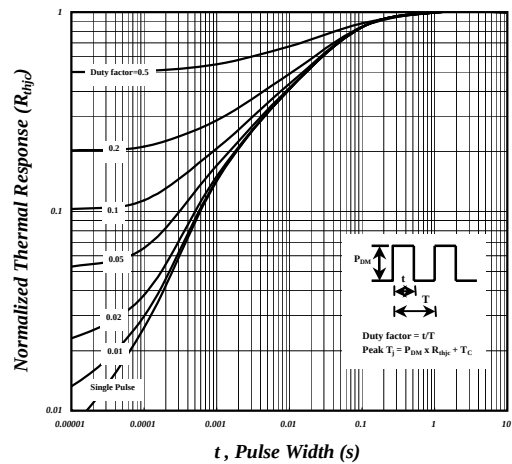


Fig10. Effective Transient Thermal Impedance

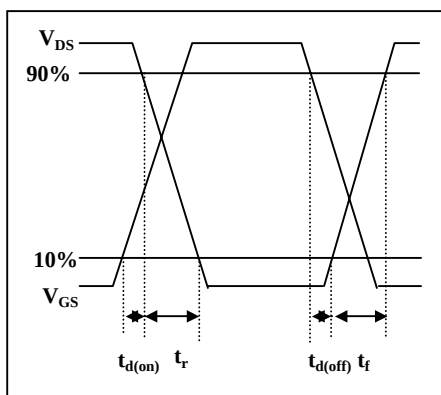


Fig 11. Switching Time Waveform

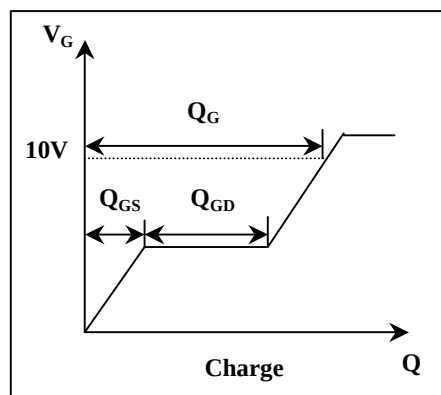


Fig 12. Gate Charge Waveform

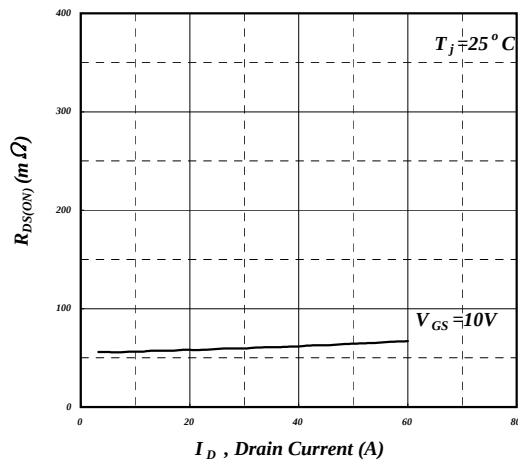


Fig 13. Typ. Drain-Source on State Resistance

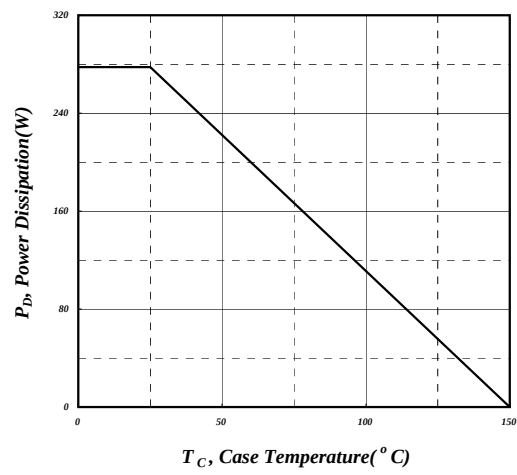
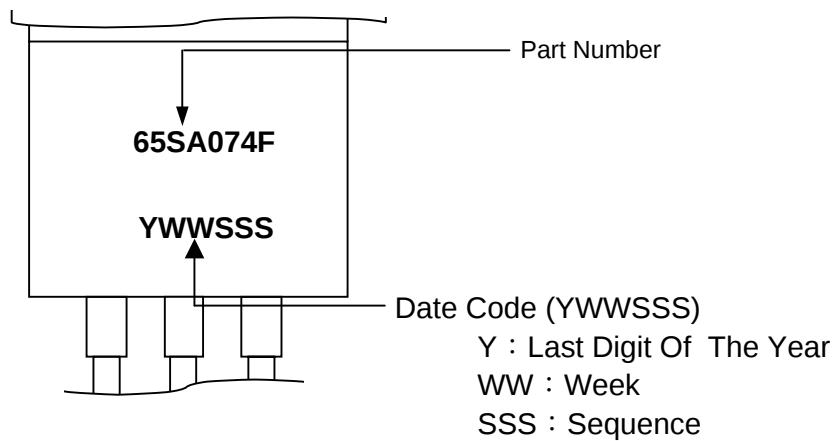
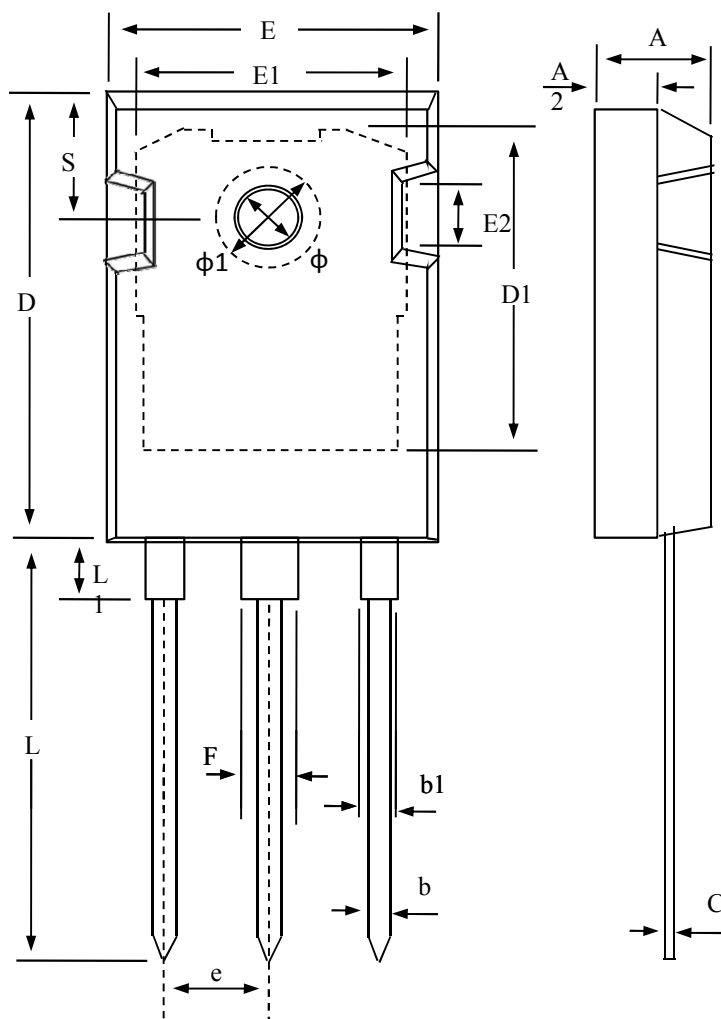


Fig 14. Total Power Dissipation

MARKING INFORMATION



Package Outline : TO-247



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.80	5.03	5.25
A2	1.90	2.05	2.20
E	15.75	15.95	16.15
E1	13.00	13.60	14.20
E2	3.60	4.35	5.10
D	20.80	20.95	21.10
D1	16.20	16.95	17.70
C	0.50	0.60	0.70
L	19.80	20.10	20.40
L1	4.10	4.25	4.40
F	2.80	3.10	3.40
b	1.05	1.20	1.35
b1	1.90	2.18	2.45
e	5.44 ref.		
ϕ	3.50	3.58	3.65
$\phi1$	7.18 ref.		
S	6.00	6.15	6.30

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

TO-247 FOOTPRINT :

